ABSTRACT OF THE DISCLOSURE

A method and apparatus for providing a zero dead time for flow analyzers, flow cytometers, and other measurement devices. A circular buffer is used to store data from a flow analyzer in a plurality of data storage areas, until it is convenient to implement more time-consuming data processing procedures. User specified parameters, including sampling rate and/or sampling period, size and number of data storage areas, size of the circular or other buffer, signal-to-noise threshold, order of processing when a plurality of Digital Signal Processors (DSPs) is used, and fixed trailing distance, are used to provide flexible and convenient operation by a user. The probability of missing a rare event occurring within the laser beam or other light beam of a flow analyzer or other measurement device is reduced to zero. Functional equivalents may be used in place of the circular buffer, for example, First In-First Out buffers which route data to a cache for potential re reading and/or reprocessing or additional processing of data, cascading buffers, etc.